SEQUENCE LISTING

<110> Tsuchiya, Masayuki
Kimura, Naoki
Fukuda, Tatsuya

<120> MODIFIED ANTIBODIES AGAINST CD22 AND USES THEREOF

<130> 14875-151US1

<150> PCT/JP2004/004696
<151> 2004-03-31

<150> JP 2003-96950
<151> 2003-03-31

<160> 36

<170> PatentIn version 3.1

<210> 1
<211> 260
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<213> Artificial

<220>
<223> an artificially synthesized peptide sequence

<400> 1

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Met Glu Arg His Trp Ile Phe Leu Phe Leu Phe Ser Val Thr Ala Gly
1               5                  10                  15

Val His Ser Gln Val Gln Leu Gln Glu Ser Gly Ala Glu Leu Ser Lys
            20                  25                  30

Pro Gly Ala Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe
        35                  40                  45

Thr Ser Tyr Trp Leu His Trp Ile Lys Gln Arg Pro Gly Gln Gly Leu
    50                  55                  60

Glu Trp Ile Gly Tyr Ile Asn Pro Arg Asn Asp Tyr Thr Glu Tyr Asn
65                  70                  75                  80

Gln Asn Phe Lys Asp Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser
                85                  90                  95

Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val
            100                 105                 110

Tyr Tyr Cys Ala Arg Arg Asp Ile Thr Thr Phe Tyr Trp Gly Gln Gly
        115                 120                 125

Thr Thr Leu Thr Val Ser Ser Gly Gly Gly Gly Ser Asp Ile Gln Leu
    130                 135                 140

Thr Gln Ser Pro Ser Ser Leu Ala Val Ser Ala Gly Glu Asn Val Thr
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145                 150                 155                 160

Met Ser Cys Lys Ser Ser Gln Ser Val Leu Tyr Ser Ala Asn His Lys
                165                 170                 175

Asn Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro Lys Leu
            180                 185                 190

Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser Gly Val Pro Asp Arg Phe
        195                 200                 205

Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Arg Val
    210                 215                 220

Gln Val Glu Asp Leu Ala Ile Tyr Tyr Cys His Gln Tyr Leu Ser Ser
225                 230                 235                 240

Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Asp Tyr Lys Asp
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Asp Asp Asp Lys
            260
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<210> 2
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<212> DNA
<213> Artificial

<220>
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<220>
<221> CDS
<222> (14)..(799)

<400> 2

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cctgaattcc acc atg gaa agg cac tgg atc ttt ctc ttc ctg ttt tca        49
               Met Glu Arg His Trp Ile Phe Leu Phe Leu Phe Ser
               1               5                   10

gta act gca ggt gtc cac tcc cag gtc cag ctg cag gag tca ggg gct       97
Val Thr Ala Gly Val His Ser Gln Val Gln Leu Gln Glu Ser Gly Ala
        15                  20                  25

gaa ctg tca aaa cct ggg gcc tca gtg aag atg tcc tgc aag gct tct      145
Glu Leu Ser Lys Pro Gly Ala Ser Val Lys Met Ser Cys Lys Ala Ser
    30                  35                  40

ggc tac acc ttt act agc tac tgg ctg cac tgg ata aaa cag agg cct      193
Gly Tyr Thr Phe Thr Ser Tyr Trp Leu His Trp Ile Lys Gln Arg Pro
45                  50                  55                  60

gga cag ggt ctg gaa tgg att gga tac att aat cct agg aat gat tat      241
Gly Gln Gly Leu Glu Trp Ile Gly Tyr Ile Asn Pro Arg Asn Asp Tyr
                65                  70                  75
```

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act gag tac aat cag aac ttc aag gac aag gcc aca ttg act gca gac      289
Thr Glu Tyr Asn Gln Asn Phe Lys Asp Lys Ala Thr Leu Thr Ala Asp
            80                  85                  90

aaa tcc tcc agc aca gcc tac atg caa ctg agc agc ctg aca tct gag      337
Lys Ser Ser Ser Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu
        95                  100                 105

gac tct gca gtc tat tac tgt gca aga agg gat att act acg ttc tac      385
Asp Ser Ala Val Tyr Tyr Cys Ala Arg Arg Asp Ile Thr Thr Phe Tyr
    110                 115                 120

tgg ggc caa ggc acc act ctc aca gtc tcc tcg ggt gga ggc ggt agc      433
Trp Gly Gln Gly Thr Thr Leu Thr Val Ser Ser Gly Gly Gly Gly Ser
125                 130                 135                 140

gac att cag ctg acc cag tct cca tca tct ctg gct gtg tct gca gga      481
Asp Ile Gln Leu Thr Gln Ser Pro Ser Ser Leu Ala Val Ser Ala Gly
                145                 150                 155

gaa aac gtc act atg agc tgt aag tcc agt caa agt gtt tta tac agt      529
Glu Asn Val Thr Met Ser Cys Lys Ser Ser Gln Ser Val Leu Tyr Ser
            160                 165                 170

gca aat cac aag aac tac ttg gcc tgg tac cag cag aaa cca ggg cag      577
Ala Asn His Lys Asn Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
        175                 180                 185

tct cct aaa ctg ctg atc tac tgg gca tcc act agg gaa tct ggt gtc      625
Ser Pro Lys Leu Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser Gly Val
    190                 195                 200

cct gat cgc ttc aca ggc agc gga tct ggg aca gat ttt act ctt acc      673
Pro Asp Arg Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
205                 210                 215                 220

atc agc aga gta caa gtt gaa gac ctg gca att tat tat tgt cac caa      721
Ile Ser Arg Val Gln Val Glu Asp Leu Ala Ile Tyr Tyr Cys His Gln
                225                 230                 235

tac ctc tcc tcg tgg acg ttc ggt gga ggg acc aag ctg gag atc aaa      769
Tyr Leu Ser Ser Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
            240                 245                 250

gac tac aag gat gac gac gat aag tga taa gcggccgcaa t                 810
Asp Tyr Lys Asp Asp Asp Asp Lys
        255                 260
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<210> 3
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<213> Artificial

<220>
<223> an artificially synthesized peptide sequence

<400> 3

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Met Asn Phe Gly Leu Arg Leu Ile Phe Leu Val Leu Thr Leu Lys Gly
1               5                  10                  15

Val Lys Cys Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys
            20                  25                  30

Pro Gly Gly Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Ala Phe
        35                  40                  45

Ser Ile Tyr Asp Met Ser Trp Val Arg Gln Thr Pro Glu Lys Arg Leu
    50                  55                  60

Glu Trp Val Ala Tyr Ile Ser Ser Gly Gly Gly Thr Thr Tyr Tyr Pro
65                  70                  75                  80

Asp Thr Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn
                85                  90                  95

Thr Leu Tyr Leu Gln Met Ser Ser Leu Lys Ser Glu Asp Thr Ala Met
            100                 105                 110

Tyr Tyr Cys Ala Arg His Ser Gly Tyr Gly Ser Ser Tyr Gly Val Leu
        115                 120                 125

Phe Ala Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ala Gly Gly
    130                 135                 140

Gly Gly Ser Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser Ala
145                 150                 155                 160

Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile
                165                 170                 175

Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val Lys
            180                 185                 190

Leu Leu Ile Tyr Tyr Thr Ser Ile Leu His Ser Gly Val Pro Ser Lys
        195                 200                 205

Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser Asn
    210                 215                 220

Leu Glu Gln Glu Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr
225                 230                 235                 240

Leu Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Asp Tyr
                245                 250                 255

Lys Asp Asp Asp Asp Lys
            260
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<210> 4
<211> 816
<212> DNA
<213> Artificial

<220>
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<220>
<221> CDS
<222> (14)..(805)

<400> 4

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cctgaattcc acc atg aac ttt ggg ctc aga ttg att ttc ctt gtc ctt        49
               Met Asn Phe Gly Leu Arg Leu Ile Phe Leu Val Leu
               1               5                   10

act tta aaa ggt gtg aag tgt gaa gtg cag ctg gtg gag tct ggg gga        97
Thr Leu Lys Gly Val Lys Cys Glu Val Gln Leu Val Glu Ser Gly Gly
        15                  20                  25

ggc tta gtg aag cct gga ggg tcc ctg aaa ctc tcc tgt gca gcc tct       145
Gly Leu Val Lys Pro Gly Gly Ser Leu Lys Leu Ser Cys Ala Ala Ser
    30                  35                  40

gga ttc gct ttc agt atc tat gac atg tct tgg gtt cgc cag act ccg       193
Gly Phe Ala Phe Ser Ile Tyr Asp Met Ser Trp Val Arg Gln Thr Pro
45                  50                  55                  60

gag aag agg ctg gag tgg gtc gca tac att agt agt ggt ggt ggt acc       241
Glu Lys Arg Leu Glu Trp Val Ala Tyr Ile Ser Ser Gly Gly Gly Thr
                65                  70                  75

acc tac tat cca gac act gtg aag ggc cga ttc acc atc tcc aga gac       289
Thr Tyr Tyr Pro Asp Thr Val Lys Gly Arg Phe Thr Ile Ser Arg Asp
            80                  85                  90

aat gcc aag aac acc ctg tac ctg caa atg agc agt ctg aag tct gag       337
Asn Ala Lys Asn Thr Leu Tyr Leu Gln Met Ser Ser Leu Lys Ser Glu
        95                  100                 105

gac aca gcc atg tat tac tgt gca aga cat agt ggc tac ggt agt agc       385
Asp Thr Ala Met Tyr Tyr Cys Ala Arg His Ser Gly Tyr Gly Ser Ser
    110                 115                 120

tac ggg gtt ttg ttt gct tac tgg ggc caa ggg act ctg gtc act gtc       433
Tyr Gly Val Leu Phe Ala Tyr Trp Gly Gln Gly Thr Leu Val Thr Val
125                 130                 135                 140

tct gca ggt gga ggc ggt agc gat atc cag atg acc cag act aca tcc       481
Ser Ala Gly Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Thr Thr Ser
                145                 150                 155

tcc ctg tct gcc tct ctg gga gac aga gtc acc att agt tgc agg gca       529
Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg Ala
            160                 165                 170

agt cag gac att agc aat tat tta aac tgg tat cag cag aaa cca gat       577
Ser Gln Asp Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp
        175                 180                 185
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gga act gtt aaa ctc ctg atc tac tac aca tca ata tta cac tca gga      625
Gly Thr Val Lys Leu Leu Ile Tyr Tyr Thr Ser Ile Leu His Ser Gly
    190                 195                 200

gtc cca tca aag ttc agt ggc agt ggg tct gga aca gat tat tct ctc      673
Val Pro Ser Lys Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu
205                 210                 215                 220

acc att agc aac ctg gag caa gaa gat ttt gcc act tac ttt tgc caa      721
Thr Ile Ser Asn Leu Glu Gln Glu Asp Phe Ala Thr Tyr Phe Cys Gln
                225                 230                 235

cag ggt aat acg ctt ccg tgg acg ttc ggt gga ggc acc aag ctg gaa      769
Gln Gly Asn Thr Leu Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu
            240                 245                 250

atc aaa gac tac aag gat gac gac gat aag tga taa gcggccgcaa t         816
Ile Lys Asp Tyr Lys Asp Asp Asp Asp Lys
        255                 260
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<210> 5
<211> 116
<212> PRT
<213> Artificial

<220>
<223> an artificially synthesized peptide sequence

<400> 5

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Gln Val Gln Leu Gln Glu Ser Gly Ala Glu Leu Ser Lys Pro Gly Ala
1               5                   10                  15

Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
            20                  25                  30

Trp Leu His Trp Ile Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
        35                  40                  45

Gly Tyr Ile Asn Pro Arg Asn Asp Tyr Thr Glu Tyr Asn Gln Asn Phe
    50                  55                  60

Lys Asp Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr
65                  70                  75                  80

Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys
                85                  90                  95

Ala Arg Arg Asp Ile Thr Thr Phe Tyr Trp Gly Gln Gly Thr Thr Leu
            100                 105                 110

Thr Val Ser Ser
        115
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<210> 6

<211> 348
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<220>
<221> CDS
<222> (1)..(348)

<400> 6
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cag gtc cag ctg cag gag tca ggg gct gaa ctg tca aaa cct ggg gcc       48
Gln Val Gln Leu Gln Glu Ser Gly Ala Glu Leu Ser Lys Pro Gly Ala
1               5                   10                  15

tca gtg aag atg tcc tgc aag gct tct ggc tac acc ttt act agc tac       96
Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
            20                  25                  30

tgg ctg cac tgg ata aaa cag agg cct gga cag ggt ctg gaa tgg att      144
Trp Leu His Trp Ile Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
        35                  40                  45

gga tac att aat cct agg aat gat tat act gag tac aat cag aac ttc      192
Gly Tyr Ile Asn Pro Arg Asn Asp Tyr Thr Glu Tyr Asn Gln Asn Phe
    50                  55                  60

aag gac aag gcc aca ttg act gca gac aaa tcc tcc agc aca gcc tac      240
Lys Asp Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr
65                  70                  75                  80

atg caa ctg agc agc ctg aca tct gag gac tct gca gtc tat tac tgt      288
Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys
                85                  90                  95

gca aga agg gat att act acg ttc tac tgg ggc caa ggc acc act ctc      336
Ala Arg Arg Asp Ile Thr Thr Phe Tyr Trp Gly Gln Gly Thr Thr Leu
            100                 105                 110

aca gtc tcc tcg                                                     348
Thr Val Ser Ser
        115
```

<210> 7
<211> 112
<212> PRT
<213> Artificial

<220>
<223> an artificially synthesized peptide sequence

<400> 7
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Asp Ile Gln Leu Thr Gln Ser Pro Ser Ser Leu Ala Val Ser Ala Gly
1               5                   10                  15
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Glu Asn Val Thr Met Ser Cys Lys Ser Ser Gln Ser Val Leu Tyr Ser
            20                  25                  30

Ala Asn His Lys Asn Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
        35                  40                  45

Ser Pro Lys Leu Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser Gly Val
    50                  55                  60

Pro Asp Arg Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
65                  70                  75                  80

Ile Ser Arg Val Gln Val Glu Asp Leu Ala Ile Tyr Tyr Cys His Gln
                85                  90                  95

Tyr Leu Ser Ser Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110
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<210> 8
<211> 336
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<220>
<221> CDS
<222> (1)..(336)

<400> 8

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gac att cag ctg acc cag tct cca tca tct ctg gct gtg tct gca gga       48
Asp Ile Gln Leu Thr Gln Ser Pro Ser Ser Leu Ala Val Ser Ala Gly
1               5                   10                  15

gaa aac gtc act atg agc tgt aag tcc agt caa agt gtt tta tac agt       96
Glu Asn Val Thr Met Ser Cys Lys Ser Ser Gln Ser Val Leu Tyr Ser
            20                  25                  30

gca aat cac aag aac tac ttg gcc tgg tac cag cag aaa cca ggg cag      144
Ala Asn His Lys Asn Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
        35                  40                  45

tct cct aaa ctg ctg atc tac tgg gca tcc act agg gaa tct ggt gtc      192
Ser Pro Lys Leu Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser Gly Val
    50                  55                  60

cct gat cgc ttc aca ggc agc gga tct ggg aca gat ttt act ctt acc      240
Pro Asp Arg Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
65                  70                  75                  80

atc agc aga gta caa gtt gaa gac ctg gca att tat tat tgt cac caa      288
Ile Ser Arg Val Gln Val Glu Asp Leu Ala Ile Tyr Tyr Cys His Gln
                85                  90                  95

tac ctc tcc tcg tgg acg ttc ggt gga ggg acc aag ctg gag atc aaa      336
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Tyr Leu Ser Ser Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
100 105 110

<210> 9
<211> 123
<212> PRT
<213> Artificial

<220>
<223> an artificially synthesized peptide sequence

<400> 9
Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Gly
1 5 10 15

Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Ala Phe Ser Ile Tyr
20 25 30

Asp Met Ser Trp Val Arg Gln Thr Pro Glu Lys Arg Leu Glu Trp Val
35 40 45

Ala Tyr Ile Ser Ser Gly Gly Gly Thr Thr Tyr Tyr Pro Asp Thr Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Thr Leu Tyr
65 70 75 80

Leu Gln Met Ser Ser Leu Lys Ser Glu Asp Thr Ala Met Tyr Tyr Cys
85 90 95

Ala Arg His Ser Gly Tyr Gly Ser Ser Tyr Gly Val Leu Phe Ala Tyr
100 105 110

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ala
115 120

<210> 10
<211> 369
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<220>
<221> CDS
<222> (1)..(369)

<400> 10
gaa gtg cag ctg gtg gag tct ggg gga ggc tta gtg aag cct gga ggg 48
Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Gly
1 5 10 15

tcc ctg aaa ctc tcc tgt gca gcc tct gga ttc gct ttc agt atc tat 96
Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Ala Phe Ser Ile Tyr

```
            20                  25                  30

gac atg tct tgg gtt cgc cag act ccg gag aag agg ctg gag tgg gtc      144
Asp Met Ser Trp Val Arg Gln Thr Pro Glu Lys Arg Leu Glu Trp Val
        35                  40                  45

gca tac att agt agt ggt ggt ggt acc acc tac tat cca gac act gtg      192
Ala Tyr Ile Ser Ser Gly Gly Gly Thr Thr Tyr Tyr Pro Asp Thr Val
    50                  55                  60

aag ggc cga ttc acc atc tcc aga gac aat gcc aag aac acc ctg tac      240
Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Thr Leu Tyr
65                  70                  75                  80

ctg caa atg agc agt ctg aag tct gag gac aca gcc atg tat tac tgt      288
Leu Gln Met Ser Ser Leu Lys Ser Glu Asp Thr Ala Met Tyr Tyr Cys
                85                  90                  95

gca aga cat agt ggc tac ggt agt agc tac ggg gtt ttg ttt gct tac      336
Ala Arg His Ser Gly Tyr Gly Ser Ser Tyr Gly Val Leu Phe Ala Tyr
            100                 105                 110

tgg ggc caa ggg act ctg gtc act gtc tct gca                         369
Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ala
        115                 120
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<210> 11
<211> 107
<212> PRT
<213> Artificial

<220>
<223> an artificially synthesized peptide sequence

<400> 11

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Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly
1               5                   10                  15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Ser Asn Tyr
            20                  25                  30

Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val Lys Leu Leu Ile
        35                  40                  45

Tyr Tyr Thr Ser Ile Leu His Ser Gly Val Pro Ser Lys Phe Ser Gly
    50                  55                  60

Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln
65                  70                  75                  80

Glu Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp
                85                  90                  95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
            100                 105
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<210> 12
<211> 321
<212> DNA
<213> Artificial

<220>
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<220>
<221> CDS
<222> (1)..(321)

<400> 12
gat atc cag atg acc cag act aca tcc tcc ctg tct gcc tct ctg gga 48
Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly
1 5 10 15

gac aga gtc acc att agt tgc agg gca agt cag gac att agc aat tat 96
Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Ser Asn Tyr
20 25 30

tta aac tgg tat cag cag aaa cca gat gga act gtt aaa ctc ctg atc 144
Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val Lys Leu Leu Ile
35 40 45

tac tac aca tca ata tta cac tca gga gtc cca tca aag ttc agt ggc 192
Tyr Tyr Thr Ser Ile Leu His Ser Gly Val Pro Ser Lys Phe Ser Gly
50 55 60

agt ggg tct gga aca gat tat tct ctc acc att agc aac ctg gag caa 240
Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln
65 70 75 80

gaa gat ttt gcc act tac ttt tgc caa cag ggt aat acg ctt ccg tgg 288
Glu Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp
85 90 95

acg ttc ggt gga ggc acc aag ctg gaa atc aaa 321
Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
100 105

<210> 13
<211> 88
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 13
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tgtccactcc caggtccagc tgcaggag 88

<210> 14
<211> 90
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 14
gatgtcctgc aaggcttctg gctacacctt tactagctac tggctgcact ggataaaaca 60

gaggcctgga cagggtctgg aatggattgg 90

<210> 15
<211> 87
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 15
cttcaaggac aaggccacat tgactgcaga caaatcctcc agcacagcct acatgcaact 60

gagcagcctg acatctgagg actctgc 87

<210> 16
<211> 88
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 16
ggcaccactc tcacagtctc ctcgggtgga ggcggtagcg acattcagct gacccagtct 60

ccatcatctc tggctgtgtc tgcaggag 88

<210> 17
<211> 91
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 17
cagtgcaaat cacaagaact acttggcctg gtaccagcag aaaccagggc agtctcctaa 60

actgctgatc tactgggcat ccactaggga a 91

<210> 18

<211> 105
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 18
ggcagcggat ctgggacaga ttttactctt accatcagca gagtacaagt tgaagacctg 60

gcaatttatt attgtcacca atacctctcc tcgtggacgt tcggt 105

<210> 19
<211> 91
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 19
ggtgtagcca gaagccttgc aggacatctt cactgaggcc ccaggttttg acagttcagc 60

ccctgactcc tgcagctgga cctgggagtg g 91

<210> 20
<211> 96
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 20
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attaatgtat ccaatccatt ccagaccctg tccagg 96

<210> 21
<211> 105
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 21
acccgaggag actgtgagag tggtgccttg gccccagtag aacgtagtaa tatcccttct 60

tgcacagtaa tagactgcag agtcctcaga tgtcaggctg ctcag 105

<210> 22
<211> 102

<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 22
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catagtgacg ttttctcctg cagacacagc cagagatgat gg 102

<210> 23
<211> 84
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 23
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agtggatgcc cagtagatca gcag 84

<210> 24
<211> 93
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 24
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cctccaccga acgtccacga ggagaggtat tgg 93

<210> 25
<211> 92
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 25
cctgaattcc accatgaact ttgggctcag attgattttc cttgtcctta ctttaaaagg 60

tgtgaagtgt gaagtgcagc tggtggagtc tg 92

<210> 26
<211> 89
<212> DNA

<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 26
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agaagaggct ggagtgggtc gcatacatt 89

<210> 27
<211> 86
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 27
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tctgaagtct gaggacacag ccatgt 86

<210> 28
<211> 98
<212> DNA
<213> Artificial

<220>
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cggggttttg tttgcttact ggggccaagg gactctggtc actgtctctg caggtggagg 60

cggtagcgat atccagatga cccagactac atcctccc 98

<210> 29
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<213> Artificial

<220>
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<210> 30
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<213> Artificial

<220>
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atacgcttcc gtggacgttc ggtggag 87

<210> 31
<211> 91
<212> DNA
<213> Artificial

<220>
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cctcccccag actccaccag ctgcacttca c 91

<210> 32
<211> 91
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<213> Artificial

<220>
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<400> 32
gtctctggag atggtgaatc ggcccttcac agtgtctgga tagtaggtgg taccaccacc 60

actactaatg tatgcgaccc actccagcct c 91

<210> 33
<211> 90
<212> DNA
<213> Artificial

<220>
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<400> 33
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aatacatggc tgtgtcctca gacttcagac 90

<210> 34
<211> 90
<212> DNA
<213> Artificial

<220>
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<400> 34
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gacagggagg atgtagtctg ggtcatctgg 90

<210> 35
<211> 93
<212> DNA
<213> Artificial

<220>
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<400> 35
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tttgatggga ctcctgagtg taatattgat gtg 93

<210> 36
<211> 85
<212> DNA
<213> Artificial

<220>
<223> an artificially synthesized DNA sequence

<400> 36
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cctccaccga acgtccacgg aagcg 85